



STAND STRONG

CW Big 5 Daily discovers the benefits of emerging concrete technologies and how significantly they are set to improve the quality of buildings in the Middle East

By Sarah Blackman

Recent events, such as the building collapse in Deira, Dubai, have proved that compromising on the quality of building materials, such as concrete, can lead to disastrous consequences.

Substandard systems may be acceptable for construction companies who wish to cut corners but, for contractors planning to construct buildings that will stand the test of time, new technologies designed to improve the life-span and quality of concrete have emerged.

"Customers are not only checking investment prices. Attributes like quality, flexibility, sustainability and service reliability are more important to them," insists Rupert Plersch, managing director of KTI Plersch, which specialises in concrete cooling.

STRENGTHENING YOUR CONCRETE

English Indian Clays manufactures High Reactivity Metakaolin (HRM), which is a chemical admixture that is formed upon the thermal treatment of kaolinite (a clay mineral).

Metakaolin prevents Alkali-Silica Reaction (ASR) - a concrete related problem that has a well documented history all over the world. This is caused by the reaction of highly alkaline cement paste with non-crystalline silica, which is found in many common aggregates, such as sand or crushed rock.

The product of this reaction is a gel that surrounds the aggregate in the concrete mix. This gel increases in volume with water and exerts an expansive pressure inside the material, causing loss of strength of the concrete, finally leading to its failure.

HRM is a pozzolan - a material which, when combined with calcium hydroxide, forms compounds possessing cementitious properties.

Experiments have shown that a mineral admixture like Metakaolin reacts with calcium to further lower the PH, reducing the potential for the formation of the ASR gel.

"We have seen a significant number of developers moving towards Metakaolin. It is the first choice of pozzolan in developed markets like Europe and the USA," says English India Clays country manager for the UAE, Pramod Pillai.

The admixture, which can enhance concrete strength to more than 12,000 pounds per square inch, was first used in 1962 for large Brazilian dams. And, the product was incorporated into The Californian, a 23-story, US \$200 million condominium tower that opened in September 2005 in Los Angeles, to prevent the tower from damage caused by earthquakes.

HRM is a Dubai Municipality certified product and has been used in UAE for eight years.

WATERPROOFING NEEDS

The use of waterproofing chemicals is also vital for protecting concrete from long-term damage. It is easy to assume that buildings in the Middle East do not need protection from water absorption and corrosion due to the lack of rain. But, if we dig a while a few metres deep, especially in cities near the ocean, then we will find water, which can put foundations and ultimately a whole structure at risk of deteriorating.

Hycrete is a company that offers a liquid, which is designed to repel water and other contaminants which could attack the rebar of a structure.

"The Hycrete forms a long-chain hydrocarbon, which plugs all capillary pores and mechanically attaches itself to the sides of the structure to prevent water from entering," reports Hycrete vice president of international sales Peter Condy.

STAY COOL

The high temperatures we experience in the Middle East can also cause damage to concrete before it even gets to a construction site. Therefore, concrete cooling is needed to prevent early setting.

KTI offers flake ice plants, mobile ice storages and ice delivery systems to meet this demand. Since 1992, the company has produced more than 1000 plants for concrete cooling all over the world and 90% of them were installed here in the Middle East.

"Depending on the recipe of the mixture and required concrete temperature we supply chilled water and ice directly to the batching plant," explains Plersch.

ENVIRONMENTAL ADVANTAGES

So, strength and durability are key selling points when it comes to building materials. But, with the growing concerns for the environment, many contractors are looking for products, which will help reduce carbon emissions produced during construction activity.

"The developers are starting to see the real value of the green movement," says Condy.

"In a relatively small project, for example, hundreds of tonnes of carbon emissions can be eliminated with the use of our technology. It is a task bringing the developers on board, but it is progressing."



Ice plants have been built in the gulf to keep concrete protected from high temperatures.

In most cases, Hycrete removes the need for exterior waterproofing products which contribute to carbon emissions. Additionally with Hycrete, concrete is reusable after the life cycle is completed, thus eliminating the need to take the material to a waste site or land fill.

Chemical giant Mapei, whose product line includes concrete admixtures, strives to produce environmentally

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CONCRETE CONTACTS

Mapei

Mapei was formed in 1937 in Milan and now operates over 53 plants world wide in 26 countries. The business is divided into nine product lines ranging from the ceramic line, which includes adhesives, natural stone and marble. It also has a building line, which includes water-proofing, mortars, concrete admixtures, cement grinding aids and sealants.
www.ibs-mapei.ae

KTI Plersch

KTI Plersch is a German refrigeration contractor, which was founded in 1923. It is specialises in concrete cooling equipment and has installed more than 1500 plants since 1986. KTI offers water chillers, flake ice plants, mobile, ice storages and ice delivery systems from transporting concrete to the desired place. The company cools down fresh water

friendly products. Today, around 5% of the company's turnover goes into research and development and 70% of that 5% goes onto research of green products alone.

"In the last 18 months there has been a lot of talk about green products in the UAE with lots of regulations coming in about them and we've been quite lucky as a lot of our products are already Leed compliant," says Mapei business development manager Laith Haboubi.

Metakaolin also has environmental advantages. Firstly, it can reduce the amount of cement used in a concrete mixture - a producer can replace up to 20% of Portland cement with Metakaolin. This replacement provides a 13% reduction in carbon emissions produced when manufacturing concrete.

In addition, when Metakaolin is used in a concrete mix, the colour of the concrete is lighter than when it is made with more traditional cementing materials, thus resulting in increased light reflectivity and, in turn, a much cooler building.

MARKET OUTLOOK

With many construction companies tightening their belts during these troubled times, are they likely to invest in concrete technologies in the near future?

Pillai doesn't think so. "We are yet to see any improvement in this field. Our only hope now is that projects, which are on hold, will re-start," he says. "I am not predicting significant increase in demand in the short-term."

"There will be a slight increase in the demand as we head into the last quarter, but nothing like it was prior to the abrupt slowdown we experienced," adds Condy. "I don't think the volume and the frantic pace will ever reach the level it was prior to the downturn."

Despite this bleak outlook, the downturn has produced a batch of healthy competition within the concrete sector.

"It should be pointed out that the higher quality concrete producers in the area have maintained their high level of quality, producing excellent concrete," says Condy. "These companies have elected not to compromise on quality and their prices have not changed much."

"Concrete companies will emerge more competitive from this experience. The competence of technical people will be tested and managements will look carefully at their formulations and quality of ingredients," adds Pillai.

So, the focus is not just on the cost of building materials but on the life-span of these products. And, if this continues, the construction industry can expect its buildings to remain on solid ground. **E**

from 45°C to less than 1°C, by using its ice bank system. The water is then turned to flake ice, which is suitable for storing or delivering to the mixer.
www.kti-plersch.com

Kryton

Kryton specialises in waterproofing for concrete structures. It manufactures a technology called Krystol, which blends in with the concrete rather than coating it and then a chemical reaction takes place. Krystol reacts with un-hydrated cement particles in the concrete to form millions of needle-like crystals. These crystals grow to fill the naturally occurring pores and voids in the concrete, which permanently blocks pathways for water. Kryton was the first company to produce a crystalline admixture complete with dissolvable bags.

www.kryton.com

KEY BUYERS PROGRAMME

A new feature of this year's edition of the Big 5 show is the Key Buyers' Programme, designed to add extra support for the industry's 300 biggest buyers - the people managing projects valued at over US \$500 million each that are based in the Middle East, North Africa, Iran and India.

These heavy-hitting deal-makers get fast track access into the show and are hosted in a private lounge, with executive suites available to conduct meetings in private.

The Key Buyers are also given more complete and detailed information on all exhibitors prior to the show, making it easier for them to pinpoint, find and discuss business with the exhibitors that are of interest to them throughout the Big 5.

"Our exhibitors want to see the key buyers and we're excited to see what the results will be this year," said DMG World Media vice president construction, Simon Mellor.



Buyers enjoy the business class experience offered by The Big 5's inaugural Key Buyers Programme in the dedicated lounge area.

